

REMARKS

By this amendment, claims 8-10 remain pending in this application. Claims 1-7 are canceled. No new matter is added. Applicants respectfully request reconsideration in view of the above amendments and the following remarks.

In the Office Action, claims 8-10 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite. Namely, the phrase “dispersed and diluted in an acidic pH” is unclear to the Examiner. In addition, claim 8 is indefinite to the Examiner because it claims a fumed silica material and not the “dispersion”.

As a result, Applicants have amended claims 8 and 10 to recite a fumed silica that has been “entirely dispersed and diluted in an acidic pH solution”. In other words, the fumed silica abrasive is entirely processed, for use in a slurry, in an acidic pH regime. Note, the features of “dispersion” and “dilution” refer to the processing of the fumed silica itself, and not to the ultimate slurry composition in which the acidic abrasive will be utilized. Accordingly, Applicants respectfully submit that the rejection is now overcome and request the Examiner for withdrawal of the same.

In addition, claims 8-10 are rejected under U.S.C. §103(a) as being obvious over Streinz et al or JP2003268354 (Keiji et al.). Claims 8-10 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 and 7-8 of copending Application No. 10/811,622.

As noted in part above, the fumed silica abrasive of claim 8 for polishing tungsten and titanium requires, at least, that the abrasive be “entirely dispersed and diluted in an acidic pH solution”. In other words, fumed silica abrasive is entirely processed, for use in a slurry, in an acidic pH regime. The inventors have surprisingly discovered that a fumed silica abrasive that

has only been processed at an acidic pH provides improved selectivity for polishing tungsten and titanium relative to dielectric layers.

For example, as indicated in paragraphs [0012] – [0017], the acidic fumed silica of the present invention is fabricated by initially filling a mixer with a predetermined volume of de-ionized water. Thereafter, a predetermined amount of acid is added to the water based upon the desired pH. After the addition of acid to the water, a mixer operates to mix the acid and water to form an acidic water solution. Next, fumed silica is dispersed in the water-acid solution in the mixer to a predetermined concentration. The high shear mixing breaks down the agglomerated structure of the dry fumed silica causing the viscosity to drop. Next, the dispersion is diluted by the addition of de-ionized water. The additional water is then mixed into the aqueous dispersion in the mixer. The amount of water added is an amount sufficient to lower the concentration of fumed silica in the aqueous dispersion to the desired final concentration. Note, the pH of the solution during dilution is maintained, preferably, between 1.5 to 5.5.

In contrast, Streinz discloses a composition for polishing rigid disks and hard disks, such as, an aluminum disk or nickel phosphor (NiP) plated aluminum disks upon which a magnetic media for computer memories will be coated. Streinz has absolutely nothing to do with polishing tungsten and titanium. In addition, the abrasive of Streinz is conventionally processed as known in the art. For example, as indicated in column 4, lines 27-57, “the aqueous dispersion of metal oxides may be produced utilizing conventional techniques, such as slowly adding the metal oxide abrasive to an appropriate media, for example, deionized water, to form a colloidal dispersion” (emphasis added). The dispersion is typically completed by subjecting it to high shear mixing conditions known to those skilled in the art. Then, the dispersion is diluted at the point of use with deionized water. Note, silica particles have an iso-electric point (“IEP”) at a pH of between 3-4. At or near its IEP, the surface charge of silica particles in aqueous solutions are at or near

zero, and thus do not have enough electric static repulsion to keep each other apart (i.e., particles will agglomerate). Hence, conventionally, silica particles are dispersed in basic conditions, not in acidic as in claim 8, for ease of handling and to maintain the pH away from the IEP to provide a high electrostatic repulsion state.

Similarly, Keiji discloses a dispersion of fumed silica that is conventionally processed as discussed above. For example, the "intermediate aqueous dispersion is added into a basic liquid to give a silica concentration of about 1 to 50 wt.% and a pH of about 8 to 12." Accordingly, the disclosures of Streinz nor Keiji teach or suggest the fumed silica of claim 8. Hence, the Applicants submit that the rejection of claim 8 is now overcome and respectfully request the Examiner for the withdrawal of the same.

Similarly, claim 10 recites a composition for polishing tungsten and titanium containing an abrasive, wherein the abrasive is fumed silica that "has been entirely dispersed and diluted in an acidic pH solution". Accordingly, claim 10 should be allowable for at least the reasons as discussed above for claim 8. Also, claim 9 depends from claim 8 and should be allowable along with claim 8 for at least the reasons as discussed for claim 8 and for its own unique combination of features that are neither taught nor suggested by the cited art.

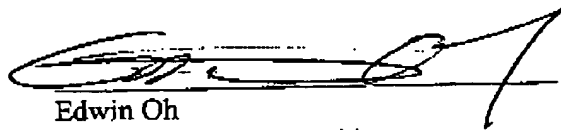
Regarding the provisional double patenting rejection, Applicants submit herewith a terminal disclaimer in compliance with 37 C.F.R. 1.321(c) to overcome the rejection.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Edwin Oh, Applicants' Attorney at 302-283-2137 so that such issues may be resolved as expeditiously as possible. For these reasons, and in view of the

above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully submitted,

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Date



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